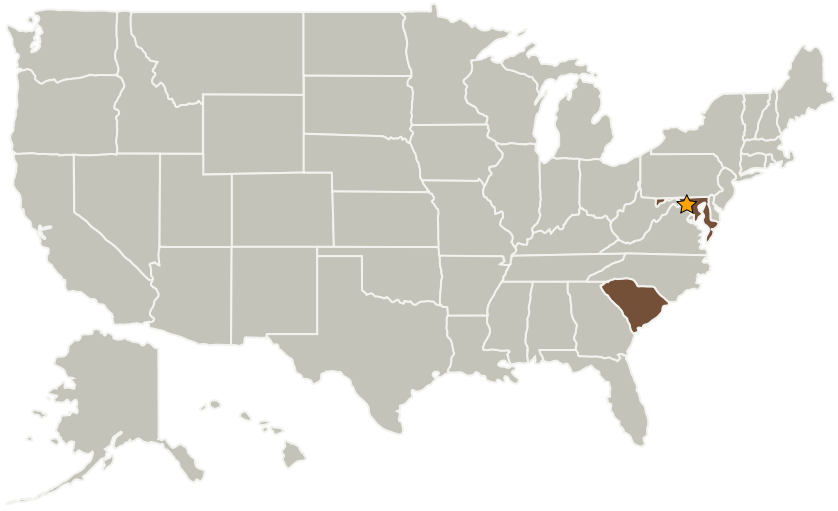
MEMOCVD Growth of AlGaN Heterojunctions for Advanced UV Photodetectors, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Sensor Electronic Technology, Inc. (SET) proposes to develop ultraviolet detectors for focal plane arrays based on wide-bandgap semiconductor materials. Direct gap III?N AlInGaN materials are the only materials capable of combining a high sensitivity for detecting UV radiation with a sharp cutoff for either visible blind (cutoff < 400 nm) or solar-blind (cutoff < 290 nm) operation. These solid state detectors are rugged, suitable in high temperature applications, have fast response times, and have spatial resolution when integrated with a silicon readout integrated circuit (ROIC). This Phase I effort will focus on the feasibility for fabricating high quantum efficiency UV detectors with the possibility to integrate multi-wavelength detection onto a single pixel. This will include heterojunction optimization that will be applicable for both single color and multi-color UV detectors. SET will perform MEMOCVD growth of high Al containing heterojunctions and will investigate the influence of material properties such as doping efficiency, donor and acceptor compensation, dopant diffusion and profile, and adatom surface migration and their influence on heterojunction performance in advanced UV photodetectors.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Sensor Electronic Technology, Inc.	Supporting Organization	Industry	Columbia, South Carolina

Primary U.S. Work Locations	
Maryland	South Carolina

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes